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TWELFTH
BIENNIAL REPORT

OF THE

Montana
State Board of Health

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FOR THE YEARS
1923--1924

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FOR THE YEARS
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INDEPENDENT PUBLISHING CO
HELENA, MONTANA

STATE OF MONTANA.

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L. H. Fligman, M. D.	Helena
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Bureau of Vital Statistics.

W. F. Cogswell, M. D., State Registrar	Helena
L. L. Benepe, Deputy State Registrar	Helena

Hygenic Laboratory.

Dr. John X. Newman, Director	Helena
S. S. Maclay, Assistant	Helena

Division of Social Hygiene.

Dr. John X, Newman, Director	Helena

Division of Water and Sewage.

W. M. Cobleigh, Consultant	Bozeman
H. B. Foote, Director	Helena
W. D. Cashmore, Assistant	Helena

Division of Food and Drugs

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Division of Child Welfare.

Dr. Hazel D. Bonness, Director *	Helena
Dr. Frances Sage Bradley, Acting Director	Helena

District Nurses.

Mrs. Ann K. Waring	Acton
Miss Margaret Thomas	Missoula
Mrs. Henrietta Crockett	Great Falls

*On leave of absence

DEPARTMENT OF PUBLIC HEALTH OF THE STATE OF MONTANA.

Office of the Secretary.
December 1, 1924.

Hon. Joseph M. Dixon, Governor,
Helena, Montana.

Sir:—

In compliance with Section 2447, Revised Codes of Montana, 1921, I herewith hand you the twelfth biennial report of the State Board of Health. In doing so I wish to thank you most heartily for your support in all public health work.

W. F. COGSWELL,
Secretary.

Finances.

The last legislature cut the State Board of Health appropriations $17,551.58 for each of the years 1923-24. The cuts indicated by the appropriations committee were in all of the divisions except the Child Welfare Division. This appropriation was increased by over $4,000 to meet the federal appropriation under the Sheppard-Towner Act. On account of the decrease in the money available, it was necessary to reorganize the work. It was found that by consolidating all the laboratory activities in the State Board of Health building at Helena, a saving of over $3,000 could be effected. The Board felt that if the efficiency of its work was to be maintained there could be no curtailment of the activities of the water laboratory and the hygenic laboratory. The matter was taken up with the International Health Board of the Rockefeller Foundation and after investigation this Board granted to the State Board of Health $4,000 a year for two years for laboratory service. This is given only for the years 1923-24. Unless the next legislature makes an increased appropriation, the work of these two laboratories will have to be curtailed. The water laboratory turns into the general fund of the state about $4,000 each year in fees. In order to continue to do this, service must be given. We were also able to procure some money from the U. S. Public Health Service for water work.

The Child Welfare Division was the only one whose appropriation was increased. The activities of this division have been very markedly extended, as the report of the director will show. Every county in the state has been covered by our public health nurses and health work has been taken to the rural districts as never before.

Communicable Disease.

There is an increasing demand on the part of local and county health officers for aid from the State Board of Health in times of epidemics. These demands cannot always be granted but much has been given. The necessity of having a person specially trained, available for the study of the sources of epidemics and for control work, cannot be over-emphasized. This is the work of an epidemiologist and every well-organized health department should have one. The State Board of Health was fortunate in having the services of Dr. John J. Sippy in this capacity for four years, but on account of lack of funds he could not be retained. Dr. Sippy, during his term of office, rendered very valuable service to the State Board of Health and to the people of Montana, not only in the field of controlling the spread of disease, but in helping to reorganize the office work. On account of his long and varied experience in health work, his advice was very valuable. It is with pleasure we hear of his continued success as full-time health officer in Stockton, California.

Table VII, report of the Bureau of Vital Statistics, shows the number of communicable diseases reported, the rate per 100,000 population, and the number of deaths for each disease, with the death rate per 100,000 for the years 1922 and 1923.

Table VIII, report of the Bureau of Vital Statistics, shows the number of such diseases for the first ten months of 1924 with the number of deaths reported.

Tuberculosis.. The apparent increase in the number of cases of tuberculosis in the years 1923 and 1924 over 1922, is no doubt due to some extent to the establishment of the veterans' tuberculosis hospital at Fort Harrison. The records show that many cases are admitted to this hospital from neighboring states and all these cases are included in our statistics. The continuance of the splendid work of the Montana State Tuberculosis Association under the leadership of its energetic secretary, Mrs. Sara E. Morse, and the opening of the children's pavilion at the tuberculosis sanitarium at Galen, together with the follow-up work of the public health nurses, ought to be reflected in future statistics.

Typhoid Fever. In Montana in 1922 there were 144 cases of typhoid fever reported with 22 deaths, a death rate of 3.7 per 100,000 of population. In 1923 there were 159 cases reported with 18 deaths, making a death rate of 3.2 per 100,000 of population. For the first 10 months of 1924, there were 111 cases reported with 9 deaths. If the same death rate prevails for the last two months of 1924 as obtained in the first 10 months, our death rate per 100,000 of population would be 2.0. These figures are based on an estimated population of 555,000. The census bureau's estimate of our population is 629,083 for 1924, but this, we believe, is too high. Based on the census bureau's estimate, the death rate, of course, would be even less. Bringing the death rate of typhoid fever from 39.9 in 1910 down to 2.0 in 1924, is a record which merits careful consideration.

Smallpox. In 1922 there were 619 cases of this disease reported, with 2 deaths. In 1923 there were 732 cases reported with 3 deaths. For the first 10 months of 1924 there were 810 cases reported with 3 deaths. On account of the mildness of this disease in recent years, people have neglected vaccination. The time is coming when this disease will assume a more malignant form in Montana as it has in many of the eastern states. When this time comes, we presume people will take a greater interest in vaccination.

Diphtheria. There is too much diphtheria in Montana. There should be none. Children can be immunized by three injections of toxin-antitoxin one week apart. Had all school children been so immunized we would not have had 64 deaths from this disease in 1922, 52 in 1923 and 38 for the first 10 months of 1924. These are absolutely preventable deaths. The State Board of Health furnishes free to the indigent, anti-toxin for the treatment of diptheria and will bear half of the expense of toxin-antitoxin for immunization when any community pays for half. Quite a number of communities have taken advantage of this offer. The following are those places which have recently had school children immunized: Hysham, Wibaux, Baker, Missoula, Great Falls and Helena.

Scarlet Fever. As a result of findings of the Drs. Dick of Chicago, a long step has been taken during the past year in the control of scarlet fever. This is one of the most dreaded diseases of childhood, not only on account of the fatality rate but on account of the damage that so often results in those cases which apparently recover. The reported results as an immunizing agent of the Dick Streptococcus toxin are most convincing. Through the courtesy of the Drs. Dick, the State Board of Health was able to obtain a supply of this toxin and in was used at the State Orphans' Home at Twin Bridges. There was an epidemic at this institution which had existed for several months. All children who had not had scarlet fever and who gave a positive reaction to the Dick test, were given three doses of the toxin, one week apart. Only one child developed scarlet fever after the giving of the toxin and in this child the disease was extremely mild and occurred within one week after the first dose. Favorable results are also reported in the treatment of scarlet fever from the administration of a serum developed by Dochez of New York. Neither of these serums are as yet on the market.

Measles. This is a most difficult disease to control, owing to the fact that the most infective stage of the disease is before it can be diagnosed and isolated—before the rash appears. Most of the deaths assigned as due to measles are from broncho-pneumonia following the acute stages of the disease. This emphasizes the importance of proper care after the acute stage has subsided. Epidemics of this disease, as a rule, occur in cycles of from three of five years. No deaths from this disease occurred in 1922 in Montana. There were 18 deaths in 1923 and 66 deaths in the first 10 months of 1924.

Poliomyelitis. (Infantile Paralysis). During the year 1922 there were 49 cases of infantile paralysis reported, with 7 deaths; in 1923 16 cases with 5 deaths. For the first 10 months of 1924 there were 167 cases with 21 deaths. Two distinct epidemics of this disease have occurred in 1924; one in Garfield County early in July, and the other in the three counties—Missoula, Ravalli and Lake, in August and September. In Garfield County there were 15 cases and 1 death. In the three western counties mentioned there occurred 94 cases and 11 deaths. In the beginning of this epidemic the cases were very severe and of the Bulbar type. Of the first 13 cases reported there were 7 deaths. Then the disease assumed a very much milder form. In the remaining 81 cases there were 4 deaths.

When the epidemic was at its height, the State Board of Health wired Surgeon General Cumming asking that an epidemiologist be sent to Montana to study these epidemics. Dr. J. P. Leake, Assistant Surgeon, U. S. Public Health Service, was immediately detailed for this work and rendered very valuable aid to the local and state authorities in control work. The epidemic started during the summer vacation when the schools were closed. In Missoula it was thought wise to delay for a time the opening of the schools until the health agencies could be properly organized. When this was done, it was decided to open the schools, even though the epidemic was apparently at its height. The advisability of this action was questioned, not only by the general public but also by some of the physicians. The results certainly justified the action, for the epidemic promptly subsided. While we do not wish to state that the subsidence of the epidemic was due to the opening of the schools, and close health supervision by the nurses, teachers and physicians, it certainly showed that when there is such supervision there is nothing to be gained in closing schools. From experience gained in this and other epidemics, it is our firm belief that in communities where health agencies are properly organized, any epidemic of a communicable disease can be better controlled with schools open. Of course, this does not apply in isolated rural communities where the only common meeting place is the school house. It is sometimes best to close schools for a time in such communities.

One outstanding feature of this epidemic in western Montana was the action of the Western Montana Medical Association in appointing from its membership an orthopedic commission for the after-treatment of the cases. This action was taken before the epidemic had subsided, so that the commission was well organized even before many of the cases were ready for treatment. Specially trained nurses were employed, physicians designated for the work, and a program outlined for treatment. The State Orthopedic Commission contributed half the funds, the other half being raised by the three counties. In Missoula the Rotary and Kiwanis Clubs gave financial aid to the project.

During the latter part of the epidemic, the Rosenow serum furnished free to the physicians by the Mayo Foundation, was quite generally used. It appears to be the consensus of opinion of the physicians using the serum, that it is valuable when used early.

Spotted Fever. In 1922 there were 58 cases of this disease reported, with 15 deaths; in 1923 there were reported 47 cases and 12 deaths and during the first 10 months of 1924, 44 cases and 10 deaths. These figures show a gradual diminution in the number of cases. The control measures of the State Board of Entomology may account for the fewer cases in the Bitter Root Valley, but no doubt the publicity given to the disease and its cause, has made the people more careful and watchful during the tick season. The research laboratory of the U. S. Public Health Service at Hamilton is doing valuable work in its attempt to solve the whole spotted fever problem. Drs. Spencer and Parker have devoted their best efforts to the perfecting of an immunizing vaccine. At the present time the outlook is most encouraging. Dr. Spencer, with the courage of his convictions, administered to himself the first dose of this vaccine ever administered to a human. A recent report from the doctor, who is now working in the hygienic laboratory in Washington, indicates that he has been able to immunize guinea pigs with his own blood serum. This would tend to show that the doctor has succeeded in producing a vaccine of very great value. That the vaccine prepared by Dr. Noguchi of the Rockefeller Foundation and administered by him to the laboratory force in Hamilton in April, 1923, does not confer lasting immunity, is proved by the death of Henry Cowan, one of the laboratory workers, who died from spotted fever seventeen months after the administration of the vaccine. However, when Dr. Noguchi made his discovery, he did not claim for it more than one year's immunization.

There has been added another martyr to the public health cause. Henry Cowan of Hamilton contracted the disease in October, 1924, and died. For twelve years, for a meagre salary, he was employed by the state and federal governments in this work. He knew that every day he was in danger but he was determined to do his part in solving the problem. During this time he saw Dr. T. B. McClintock of the U. S. Public Health Service, contract the disease and die. He saw Dr. Arthur McCray, working in the State Board of Health laboratory, contract the disease and die. He saw W. E. Gettinger contract the disease in the laboratory at Hamilton and die. He heard of one other laboratory worker in the Rockefeller Institute laboratory in New York, who contracted the disease and died, but he continued his work.

The death of Henry Cowan naturally cast a gloom over his associates but there has never been a suggestion from any of them of resigning. They are a determined bunch of workers,—determined to solve the problem, and they will solve it if they are given proper support by the public.

If we could animate the dead who have been sacrificed in this work, as the immortal McCrae animated the dead in Flanders fields, they would speak in similar tones:

"We are the dead.
Short days ago we lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders Fields.

Take up our quarrel with the foe.
To you from falling hands we throw the torch.
Be yours to hold it high.
If ye break faith with us who die,
We shall not sleep, though poppies grow
In Flanders Fields."

BUREAU OF VITAL STATISTICS.

W. F. Cogswell, M. D., State Registrar, Helena
L. L. Benepe, Deputy State Registrar, Helena

The Vital Statistics Act was passed in 1907 and became effective June 1st of that year, providing for the central registration of births and deaths for legal, sanitary, and statistical purposes. The Bureau of Vital Statistics was placed under the supervision of the Secretary of the State Board of Health, who is the State Registrar.

From that time forward there has been an attempt made to collect in the Bureau all the records of births and deaths occuring within the state, with an ever increasing percentage of the total in both categories, as persons connected with the gathering of the material from the field became more familiar with the work. The records for the first six months, June through November, 1907, the initial months in which the Registration Act became effective, are not available. The following table shows the total number of births and deaths collected for the years 1908 through 1923, together with the Vital Index, i. e., 100 Births/Deaths.

TABLE I.

The Number of Births and Deaths Occurring in Montana 1908–1923.
The Excess of Births over Deaths, and the Vital Index.

Year—	Births	Deaths	Excess Births over Deaths	Vital Index
December, 1907, through November, 1908	5,842	4,353	511	134.2
July 1, 1908, to June 30, 1909	6,021	4,241	1,780	142.0
July 1, 1909, to June 30, 1910	6,294	3,911	2,383	160.9
Calendar year				
1910	6,124	3,996	2,128	153.2
1911	7,542	4,006	3,536	188.2
1912	8,133	4,397	3,736	185 0
1913	8,682	5,098	3,584	170.3
1914	9,969	5,048	4,921	197.5
1915	11,132	5,242	5,890	212.3
1916	11,300*	5,483	5,817	206.0
1917	11,600*	6,421	5,179	180.6
1918	11,800*	8,985	2,815	131.3‡
1919	12,017	5,786	6,231	207.7
1920	11,862	5,289	6,573	224.2
1921	12,127	4,693	7,488	258.4
1922	11,060	5,106	5,954	216.6
1923	10,524	4,914	5,615	214.4

* Estimated
‡ Flu year.

1908 through 1915 include still births in both the births and deaths.
1916 through 1923 do not include still births.

Montana was admitted to the U. S. Registration Area for deaths in 1910, having proved to the federal authorities that year that we were receiving over 90 per cent of the deaths occurring in the state. We have every reason to believe we are receiving reports for practically all deaths occurring in the state. There are,however, a few cases where no undertaker is employed, and the families burying the body do not know that a report is required. When these cases come to our attention, steps are promptly taken to obtain a report.

Satisfactory birth reporting was not obtained until about 1919, as can be seen from the Vital Index column of the previous table. The average for the last five years would indicate that we are now getting 2¼ times as many births as deaths, or for every 100 deaths there are approximately 225 births in the state.

In 1921 this office requested the U. S. Census Bureau to make a birth check for Montana so that we might enter the Birth Registration Area. The check covered the months of July and August of 1921 and indicated reporting of 93.4% of births for those months. We were accordingly admitted as the twenty-fourth state in the U. S. Birth Registration Area on January 1, 1922.

(The Census Bureau instituted a check of our births in October of 1924. All deaths for children under one year of age dying between January 1 and September 1, 1924, were taken and checked for the corresponding birth certificates. Of 303 dying during that period, only 17, or 5.6%, were found without birth certificates on file. This would indicate that we are receiving over 94% of the total births occurring in the state.)

The births we fail to get and that we have the greatest trouble in obtaining, are those attended by midwives, or neighbors not midwives, who act in that capacity and who are ignorant of the fact that it is necessary for the attendant to file a birth certificate. An effort is made to secure such birth certificates when the fact becomes known to this office.

The Census Bureau estimates our increase in population according to the average yearly increase between the Census counts of 1910 and 1920. This method would indicate that our population is increasing at the rate of approximately 18,000 per year, and would give us a population as of July 1, 1923, of 611,720. Realizing that our population is not increasing at this rate, the school census was used as a basis for estimation, taking the school census of 1920, the actual census of 1920, and the school census of 1923 and making the proportion School Census 1920: Population 1920:: School Census 1923: X. Fitting this proportion onto each of the counties we obtained the following results: (See Table II.)

TABLE II.

Table Showing per cent gain or loss in Population by Counties 1920–1923, and the Estimated Population, 1923.

GAIN

County—	Per cent gain	Estimated population, 1923
1. Glacier	49.1*	6,229
2. Big Horn	30.5*	9,155
3. Deer Lodge	19.8	18,356
4. Valley	17.0	12,324
5. Yellowstone	14.5	33,892
6. Lincoln	14.3	8,912
7. Toole	11.5	4,152
8. Silver Bow	10.2	66,465
9. Cascade	7.9	40,079
10. Sheridan	6.3	9,967
11. Lewis & Clark	6.1	19,798
12. Park	6.0	12,010
13. Prairie	5.9	3,910
14. Custer	4.6	12,755
15. Roosevelt	4.4	10,802
16. Carbon	4.3	15,935
17. Mineral	4.0	2,420
18. Fallon	3.5	4,707
19. Sanders	2.9	5,045
20. Pondera	2.2	5,867
21. Gallatin	1.2	16,054
22. Teton	0.1	5,876
23. Lake	0.0‡	7,518

LOSS

County—	Per cent loss	Estimated population, 1923
1. Judith Basin	36.0	2,741
2. Chouteau	28.5	7,901
3. Liberty	22.4	1,875
4. Treasure	21.6	1,560
5. Missoula	20.5†	19,113
6. Golden Valley	20.0	3,420
7. Blaine	19.2	7,318
8. Phillips	18.4	7,597
9. Garfield	17.3	4,439
10. Flathead	17.0†	18,015
11. Hill	17.0	11,585
12. Stillwater	13.9	6,569
13. Wheatland	10.8	5,012
14. Madison	10.0	6,746
15. Broadwater	8.6	2,960
16. Granite	8.0	3,834
17. Fergus	7.4	23,898
18. Ravalli	7.2	9,370
19. Powell	7.1	6,418
20. Rosebud	5.7	7,545
21. Carter	5.4	3,757
22. Sweetgrass	5.3	4,216
23. Jefferson	5.2	4,932
24. Powder River	4.1	3.219
25. Beaverhead	3.7	7,096
26. McCone	2.9	4,609
27. Musselshell	2.7	8,105
28. Dawson	2.5	9,008
29. Meagher	2.1	2,593
30. Wibaux	1.0	3,082
31. Daniels	0.4	5,458
32. Richland	0.3	8,962

Montana (state total) gain 0.8, estimated pop. 555,172.

* Increase due to including Indian children in the school census for the first time.

† Decrease due to creation of Lake county from portions of these two.

‡ Created August, 1923, from portions of Flathead and Missoula Counties.

In 1922 Montana had the second lowest death rate in the U. S. Registration Area, with a rate of 8.6 per 1,000 of population, Idaho being the only state with a lower death rate; its rate was 8.1 per 1,000. The average rate for the whole Registration Area was 11.8.

In 1923 we find similar conditions. Idaho had the lowest rate in the Area with 7.1, and Montana second lowest with a rate of 8.0 The Registration Area for the year showed a rate of 12.3 per 1,000 of population.

For births in 1922 Montana had a rate of 18.3 per 1,000, the second lowest rate in the Birth Registration Area, Washington with 18 per 1,000 was the only one lower. The Area average was 22.7.

For 1923 births in Montana dropped to the bottom of the list with 17.1 per 1,000. The Area average was 22.7. These figures are derived from our over-estimated population. When the population based upon the school census is used we get a different picture. The death rate for 1923 amounts to 8.8 and the birth rate 19.0 per 1,000 of population. This would still leave us second lowest in death rate and we would exceed both Washington and Oregon in birth rate.

By way of comparison the crude birth and death rates per 1,000 of population for Montana are shown over a period of years:

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923*
Deaths	10.1	9.8	11.6	10.7	10.8	11.9	13.1	17.3	10.7	9.5	8.2	8.6	8.9
Births	....	....	....	....	....	....	....	....	22.6	21.6	21.7	18.6	19.0

* School census basis.

The rates used throughout the tables for 1922 ared based upon the population as calculated from the 1910–20 census counts, it being 593,657; for 1923 upon the school census basis, it being 555,172.

TABLE III.

1922 Births by Counties and Months, the Totals by Counties and their rates per 1,000 of population.

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate
Montana, state total	987	922	1004	913	980	910	974	888	896	1006	773	807	11,060	18.6
Beaverhead	8	11	10	5	11	7	8	8	9	9	6	8	100	12.5
Big Horn	16	13	22	27	15	23	21	18	22	16	14	18	225	29.7
Blaine	18	22	36	12	18	16	7	13	12	16	11	9	190	19.4
Broadwater	7	5	2	3	5	5	0	9	6	3	5	2	52	14.8
Carbon	28	34	35	26	22	21	24	23	20	28	23	10	294	17.8
Carter	3	3	3	3	3	6	4	9	4	2	4	2	46	10.7
Cascade	7	17	12	9	6	10	10	8	5	5	5	8	102	7.2
Great Falls	70	62	48	58	57	58	62	50	58	63	54	61	701	26.9
Chouteau	9	9	16	17	26	9	15	20	13	15	16	11	176	14.7
Custer	28	29	24	23	27	29	16	31	21	22	24	19	293	22.2
Daniels	4	6	8	14	9	13	20	3	3	4	7	4	95	16.0
Dawson	19	22	21	21	23	13	25	14	14	28	17	18	235	23.5
Deer Lodge	1	0	0	4	2	2	3	3	1	0	2	0	18	4.5
Anaconda	18	21	19	18	23	14	19	17	20	18	24	22	233	18.5
Fallon	7	6	2	6	6	10	5	10	8	16	7	8	91	17.9
Fergus	39	34	51	42	41	31	45	31	46	47	35	29	471	16.9
Flathead	50	48	51	26	45	23	50	44	33	36	37	30	473	20.1
Gallatin	43	22	34	25	45	35	33	29	38	35	28	28	395	23.0
Garfield	9	5	7	7	9	4	11	7	9	9	5	5	87	15.0
Glacier	16	16	13	17	7	14	9	8	12	20	3	16	151	33.2
Golden Valley	16	2	7	9	5	11	5	6	6	4	6	4	81	17.5
Granite	1	4	2	5	5	9	4	3	8	1	2	2	46	10.1
Hill	25	34	28	30	30	28	23	30	26	33	22	16	325	21.5
Jefferson	5	5	3	3	7	0	3	3	4	0	4	7	44	7.8
Judith Basin	8	11	4	7	1	6	6	3	6	10	5	8	75	16.2
Lewis & Clark	11	8	7	18	7	6	10	6	7	7	7	3	97	13.5
Helena (city)	26	27	25	22	25	19	26	30	33	32	20	19	304	23.3
Liberty	3	6	1	2	3	5	5	1	8	4	5	4	47	18.0
Lincoln	13	11	7	14	7	15	18	11	11	20	10	13	150	17.7
McCone	2	3	11	6	10	10	11	6	9	12	3	0	83	16.2
Madison	10	8	12	13	9	10	1	4	4	9	8	10	98	12.1
Meagher	3	5	5	1	6	1	4	1	0	3	2	1	32	11.3
Mineral	3	0	6	1	3	0	0	3	0	0	2	2	20	8.0
Missoula	14	15	17	18	18	13	16	12	24	22	16	13	198	16.1
Missoula (city)	34	39	39	53	35	32	31	44	41	35	31	49	463	33.8
Musselshell	20	18	23	21	13	17	11	15	13	20	17	20	208	23.1
Park	26	18	21	22	25	25	19	26	18	14	14	31	259	21.1
Phillips	13	12	23	15	14	11	13	16	16	17	7	13	170	16.9
Pondera	12	9	12	8	14	14	14	15	14	16	13	15	156	25.1
Powder River	6	4	1	4	7	3	1	3	3	4	2	2	40	11.0
Powell	13	3	11	10	14	21	13	4	6	9	10	11	125	16.7
Prairie	14	5	3	11	5	4	8	7	11	12	8	7	95	23.8
Ravalli	26	18	25	14	20	24	24	10	20	15	10	13	219	20.0
Richland	14	17	17	4	15	8	12	11	5	17	10	16	146	15.0
Roosevelt	26	21	36	24	24	16	17	24	24	21	16	16	265	23.7
Rosebud	12	15	14	10	13	17	10	20	13	19	10	19	162	18.5
Sanders	8	7	15	4	4	5	6	7	2	3	6	6	73	13.8
Sheridan	18	11	18	14	14	14	15	16	21	24	13	10	188	18.5
Silver Bow	16	21	21	15	29	24	35	19	21	30	20	17	268	13.3
Butte	46	38	39	46	66	42	52	50	48	52	38	56	573	12.7
Stillwater	13	20	12	12	16	21	13	21	10	17	16	14	185	22.4
Sweetgrass	7	15	16	11	7	4	12	11	6	5	6	5	105	21.8
Teton	16	6	11	7	7	14	13	9	8	12	5	11	119	18.7
Toole	8	7	8	2	2	5	5	3	5	6	2	6	59	14.6
Treasure	2	3	2	2	0	3	4	6	4	2	3	1	32	14.9
Valley	18	18	16	24	17	22	27	22	21	23	22	15	245	21.5
Wheatland	9	11	12	7	13	9	18	6	12	8	5	8	118	19.4
Wibaux	5	6	2	5	3	8	5	8	5	5	4	2	68	17.2
Yellowstone	30	24	28	25	20	24	31	20	17	26	17	23	285	18.2
Billings	35	32	30	31	47	47	46	21	32	45	29	21	416	25.5

TABLE IV.

1923 Births by Counties and Months, the Totals by Counties and their rates per 1,000 of population.*

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate
Montana, state total	886	824	1000	914	852	921	891	891	899	830	828	788	10,524	19.0
Beaverhead	9	3	9	6	4	7	11	12	14	12	7	5	99	14.0
Big Horn	19	15	17	12	11	14	11	23	23	16	16	14	191	20.9
Blaine	2	8	18	19	14	6	17	15	12	14	15	13	153	20.9
Broadwater	3	2	2	4	4	7	3	5	11	1	6	5	53	17.9
Carbon	28	16	39	26	31	35	29	32	28	24	18	12	318	19.9
Carter	3	1	4	5	1	4	2	4	5	1	1	0	31	8.0
Cascade	12	11	14	9	11	12	13	9	14	6	5	11	127	22.3
Great Falls	68	66	72	79	67	62	64	50	77	55	64	44	768	
Chouteau	10	10	7	14	8	16	14	18	9	10	6	9	131	16.6
Custer	21	17	28	14	13	17	25	26	30	23	23	23	260	20.4
Daniels	3	10	5	15	6	12	13	7	8	13	14	13	119	21.8
Dawson	14	20	22	18	32	21	18	19	18	18	13	18	231	25.6
Deer Lodge	0	1	1	0	2	0	2	0	2	1	2	1	12	12.9
Anaconda	23	13	22	16	23	22	25	13	16	18	21	13	225	
Fallon	8	7	11	10	8	2	8	10	7	8	8	9	96	20.4
Fergus	33	30	35	40	39	31	33	41	40	35	35	34	426	17.7
Flathead	34	45	45	42	37	38	40	34	31	31	33	31	441	24.5
Gallatin	53	34	31	31	25	34	35	28	27	35	22	28	383	23.9
Garfield	8	9	7	6	3	0	4	4	3	7	6	1	58	13.1
Glacier	5	7	5	7	12	7	6	10	14	10	11	7	101	16.2
Golden Valley	5	6	5	4	5	5	9	12	5	2	2	1	61	17.5
Granite	2	4	4	4	1	5	2	6	1	0	0	0	29	7.6
Hill	25	16	29	18	34	28	33	17	29	21	22	34	306	26.3
Jefferson	2	5	6	5	7	2	2	3	4	4	1	5	46	9.3
Judith Basin	8	6	8	6	6	3	4	2	0	5	4	7	59	21.5
Lewis & Clark	5	5	7	10	9	12	6	5	6	8	3	7	83	18.1
Helena	23	24	24	22	19	23	30	25	20	18	26	21	275	
Liberty	5	4	7	2	1	3	5	5	2	4	1	1	40	21.3
Lincoln	9	11	11	9	13	14	16	14	13	12	13	15	150	16.8
McCone	7	6	9	6	8	6	8	7	3	7	7	8	82	17.8
Madison	9	5	15	8	6	5	12	9	8	2	6	2	87	12.9
Meagher	7	1	3	2	1	3	0	2	1	4	4	2	30	11.6
Mineral	3	1	2	2	3	2	1	3	0	0	3	1	21	8.7
Missoula	16	14	12	21	21	7	3	9	7	6	5	3	124	30.4
Missoula, city	31	35	45	40	41	44	31	48	38	33	36	36	458	
Musselshell	24	20	17	19	13	13	17	20	20	12	13	9	197	24.3
Park	15	17	25	18	21	19	31	21	21	15	26	18	247	20.6
Phillips	15	13	16	10	10	18	13	7	12	14	10	14	152	20.0
Pondera	14	11	17	14	10	7	16	1	30	6	12	16	154	25.5
Powder River	6	4	3	1	6	5	2	5	3	5	1	1	42	13.0
Powell	9	12	9	12	7	9	5	7	3	10	8	3	94	14.6
Prairie	8	8	10	5	8	9	1	10	13	16	7	9	104	26.7
Ravalli	10	22	19	17	6	15	12	23	10	12	17	9	172	18.4
Richland	14	8	12	14	17	18	11	12	12	12	15	14	159	17.7
Roosevelt	18	21	22	25	21	17	19	17	24	19	11	15	229	21.2
Rosebud	16	13	20	11	7	8	6	10	11	19	12	5	138	18.3
Sanders	3	10	3	4	4	2	8	3	5	6	4	3	55	10.9
Sheridan	13	12	24	15	12	15	6	11	17	14	14	16	169	17.0
Silver Bow	15	16	19	29	7	39	11	13	18	22	26	22	237	13.2
Butte	53	47	54	57	48	68	54	62	44	49	45	59	640	
Stillwater	20	9	16	8	16	16	20	11	14	10	11	10	161	24.5
Sweetgrass	5	7	13	14	10	3	8	17	7	4	7	0	95	22.5
Teton	14	7	3	10	5	10	7	4	5	3	6	10	84	14.3
Toole	1	4	10	2	7	6	8	14	3	2	3	10	70	16.6
Treasure	3	1	6	1	6	0	3	6	3	2	3	1	35	22.4
Valley	27	23	21	29	20	33	15	28	19	24	32	19	290	23.5
Wheatland	14	1[illegible]	11	9	5	11	9	8	13	8	4	8	114	22.7
Wibaux	3	3	4	2	5	3	7	1	4	1	7	4	44	14.5
Yellowstone	21	22	30	24	22	24	22	9	10	16	21	18	239	20.5
Billings	32	31	35	32	33	42	44	38	37	51	38	45	458	
Lake	0	1	0	0	0	2	1	6	15	14	16	16	71	18.4

* Note: Includes delays through August, 1924.

TABLE V.

1922 Deaths by Counties and Months, the Totals by Counties and their rates per 1,000 of population.

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate
Montana, state total	400	428	681	404	425	412	364	357	413	389	384	449	5106	8.6
Beaverhead	5	4	8	6	7	6	3	5	8	9	5	9	75	9.4
Big Horn	6	9	10	10	8	8	8	9	9	13	9	8	107	14.1
Blaine	5	5	10	9	4	7	3	11	6	3	4	3	70	7.1
Broadwater	1	1	1	1	3	2	1	4	2	0	2	2	20	5.7
Carbon	7	9	21	10	9	6	9	4	14	5	9	3	106	6.4
Carter	3	2	2	1	3	1	1	0	0	1	1	0	15	3.5
Cascade	2	3	13	4	2	5	2	4	3	2	5	6	51	3.6
Great Falls	33	36	37	36	27	22	25	16	16	25	22	26	321	12.3
Chouteau	5	5	11	7	2	4	4	3	5	4	4	4	58	4.8
Custer	6	10	10	8	7	12	7	7	14	3	9	8	101	7.7
Daniels	2	2	2	1	2	0	0	1	5	4	1	5	25	4.2
Dawson	9	4	9	6	4	7	2	8	5	10	6	10	80	8.0
Deer Lodge*	15	14	31	23	24	9	12	21	18	18	19	19	223	55.7
Anaconda	7	12	24	11	17	10	5	8	8	5	6	14	127	10.1
Fallon	2	2	2	0	2	1	1	0	0	1	1	2	14	2.8
Fergus	24	15	23	11	11	14	11	11	10	17	16	20	183	6.6
Flathead	22	17	15	22	21	17	20	13	27	16	15	17	222	9.5
Gallatin	14	9	20	8	16	11	12	15	12	11	8	14	150	8.7
Garfield	3	1	2	1	2	4	2	1	0	3	5	4	28	4.8
Glacier	6	4	11	7	4	7	8	2	7	6	2	3	67	14.8
Golden Valley	3	2	4	1	2	2	5	1	1	2	4	0	27	5.8
Granite	4	1	3	3	4	2	3	1	0	1	2	6	30	6.7
Hill	5	11	18	6	6	10	6	14	14	12	7	7	116	7.7
Jefferson	3	3	3	6	1	6	0	6	6	4	3	4	45	8.0
Judith Basin	0	7	2	2	1	4	1	1	2	0	2	2	24	5.2
Lewis & Clark	3	5	8	9	6	7	6	2	7	3	6	3	65	9.0
Helena	18	13	29	13	10	19	9	11	17	13	11	17	180	13.8
Liberty	0	1	0	0	2	0	0	0	1	1	1	6	12	4.6
Lincoln	3	3	4	5	4	6	4	4	5	7	2	10	57	6.8
McCone	0	0	6	2	4	3	2	0	2	1	1	1	22	4.2
Madison	5	6	15	4	4	6	3	5	1	5	4	6	64	7.9
Meagher	2	2	5	2	0	2	1	0	0	1	3	0	18	6.3
Mineral	1	0	2	1	0	2	1	3	1	0	4	0	15	6.0
Missoula	9	15	7	6	9	8	9	4	6	8	9	5	95	7.7
Missoula, city	24	24	28	21	23	15	17	15	18	13	19	28	245	17.9
Musselshell	6	6	7	8	5	6	4	11	3	2	7	5	70	7.8
Park	13	9	15	11	12	6	12	10	11	9	4	9	121	9.8
Phillips	4	11	3	3	2	6	4	1	5	4	1	3	47	4.7
Pondera	1	5	12	1	2	4	2	5	5	3	4	4	48	7.7
Powder River	1	1	0	1	2	2	1	1	0	1	0	3	13	3.6
Powell	3	3	3	3	4	7	6	3	4	3	2	3	44	5.9
Prairie	2	1	7	4	2	1	2	0	1	2	1	6	29	7.3
Ravalli	10	11	11	10	10	17	6	6	9	13	5	4	112	10.2
Richland	1	2	7	4	4	5	5	5	6	1	5	4	49	5.0
Roosevelt	3	5	8	3	1	1	9	9	5	9	4	4	61	5.4
Rosebud	6	3	11	1	6	6	7	2	0	3	3	4	52	6.0
Sanders	4	6	8	1	3	7	5	3	5	2	2	3	49	9.2
Sheridan	0	1	5	2	2	0	4	2	4	5	5	3	33	3.3
Silver Bow	9	15	27	15	24	19	16	18	12	21	21	17	214	10.6
Butte	40	44	84	32	47	32	44	34	47	47	44	55	550	12.2
Stillwater	2	7	9	0	4	6	2	6	5	3	6	5	55	6.7
Sweetgrass	1	4	1	3	1	4	3	4	1	2	0	4	28	5.8
Teton	5	6	3	5	5	3	1	1	5	4	6	2	46	7.2
Toole	0	2	5	2	2	0	0	0	2	0	0	5	18	4.5
Treasure	0	1	1	2	1	0	0	0	0	1	1	1	8	3.7
Valley	5	5	8	10	3	7	2	2	8	5	8	4	67	5.9
Wheatland	3	6	7	1	4	2	4	7	6	5	1	2	48	7.9
Wibaux	0	2	1	0	2	2	0	0	3	1	0	1	12	3.6
Yellowstone	6	8	8	7	7	8	7	4	3	9	8	8	83	5.3
Billings	18	7	34	12	19	16	15	13	13	7	19	18	191	11.7

* Includes State Hospital for Insane and Tuberculosis Sanitarium.

TABLE VI.

1923 Deaths by Counties and Months, the Totals by Counties and their rates per 1,000 of population.*

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate
Montana, state total	472	472	486	442	425	411	370	361	365	360	355	397	4916	8.8
Beaverhead	3	2	6	9	3	6	5	2	4	9	4	4	57	8.0
Big Horn	12	9	12	5	8	7	8	5	10	10	9	8	103	11.3
Blaine	6	7	5	9	7	6	7	5	13	7	0	4	76	10.4
Broadwater	2	2	2	1	3	0	0	6	1	3	0	1	21	7.1
Carbon	7	10	13	8	2	12	6	6	5	5	10	9	93	5.8
Carter	2	2	0	0	0	1	1	1	2	1	0	3	13	3.5
Cascade	4	12	3	4	9	10	7	5	2	5	8	4	73	8.3
Great Falls	15	23	25	31	16	16	21	23	22	17	21	30	260	
Chouteau	5	11	9	7	10	4	6	10	3	2	2	6	75	9.5
Custer	9	16	8	5	8	11	15	9	6	7	7	7	108	8.5
Daniels	3	2	6	5	1	4	1	0	2	2	4	2	32	5.9
Dawson	9	9	7	5	8	8	4	9	5	7	8	5	84	9.4
Deer Lodge	24	15	22	19	20	15	11	9	12	15	15	27	204	18.8
Anaconda	15	14	11	17	10	9	8	9	14	12	9	14	142	
Fallon	3	3	2	1	2	1	2	1	1	0	4	2	22	8.9
Fergus	12	9	19	7	19	17	7	8	14	10	14	13	149	6.2
Flathead	18	16	18	20	18	22	14	10	9	14	17	17	193	10.7
Gallatin	14	9	12	11	9	14	8	4	9	9	8	12	119	7.4
Garfield	2	1	0	1	2	0	1	1	0	4	0	0	12	2.7
Glacier	4	5	9	9	4	1	3	3	3	5	4	8	58	9.3
Golden Valley	1	0	7	1	1	2	0	1	0	0	0	1	14	4.1
Granite	6	4	1	3	3	2	2	2	1	2	3	3	32	8.3
Hill	10	9	9	6	10	9	8	4	10	6	9	7	97	8.4
Jefferson	0	1	6	0	4	6	9	4	6	1	3	3	43	8.7
Judith Basin	3	1	0	2	3	3	2	1	0	0	0	1	16	6.6
Lewis & Clark	6	2	2	8	6	6	6	1	3	1	0	3	44	11.6
Helena, city	21	17	18	17	14	10	13	15	23	15	14	9	186	
Liberty	1	1	2	2	0	0	2	1	2	0	1	2	14	7.5
Lincoln	6	4	4	6	4	5	5	5	3	6	8	5	61	6.8
McCone	2	2	1	0	4	2	1	1	1	1	4	3	22	4.8
Madison	5	5	4	6	2	3	8	7	2	2	4	5	53	7.9
Meagher	3	1	1	3	2	0	0	1	2	1	0	1	15	5.7
Mineral	2	3	0	0	1	3	2	1	3	2	2	0	19	7.9
Missoula	8	6	10	7	7	12	9	5	0	1	4	0	69	15.8
Missoula city	35	25	17	21	18	22	8	17	18	21	12	19	233	
Musselshell	5	15	5	7	8	11	2	2	5	9	4	4	77	9.5
Park	9	5	5	13	11	10	10	7	11	9	8	7	105	8.7
Phillips	4	6	9	4	5	6	4	1	7	6	4	1	57	7.5
Pondera	5	5	1	7	2	9	3	6	3	6	3	0	50	8.5
Powder River	0	1	0	4	0	0	0	0	1	1	1	0	8	2.5
Powell	7	3	5	6	3	5	8	5	7	2	4	2	57	8.9
Prairie	2	6	1	3	0	2	2	2	0	3	1	3	25	6.4
Ravalli	6	8	7	5	9	11	7	4	9	9	7	11	93	9.9
Richland	6	4	8	7	6	6	6	5	2	2	3	3	58	6.5
Roosevelt	3	3	8	2	5	4	2	3	7	4	6	1	48	4.4
Rosebud	9	7	10	3	8	8	6	8	4	0	5	2	70	9.3
Sanders	3	3	2	4	1	0	0	1	4	3	7	5	33	6.3
Sheridan	4	4	7	4	4	3	9	5	2	2	2	5	51	5.1
Silver Bow	24	24	37	24	27	19	15	7	19	16	16	23	251	11.9
Butte	58	59	51	50	47	28	40	59	26	47	35	43	543	
Stillwater	4	2	7	1	1	3	3	4	2	1	6	3	37	5.6
Sweetgrass	2	2	2	4	4	2	5	4	2	0	1	4	32	7.6
Teton	6	3	3	5	2	0	2	8	1	3	2	0	35	6.0
Toole	4	2	4	3	3	3	3	4	0	2	1	3	32	7.7
Treasure	0	3	1	2	0	2	2	0	2	0	0	2	14	9.0
Valley	5	4	5	7	9	5	7	6	6	2	0	4	60	4.9
Wheatland	2	1	6	2	6	1	2	3	6	4	1	3	37	7.4
Wibaux	1	3	3	0	0	1	1	1	0	1	2	1	14	3.7
Yellowstone	12	13	9	3	10	6	5	3	3	3	3	4	74	8.6
Billings	13	28	19	16	16	15	16	19	19	18	16	22	217	
Lake	0	0	0	0	0	2	0	2	6	4	9	3	26	6.[illegible]

Note: Includes delays through September, 1924.

TABLE VII.

Communicable Disease Table Showing the Number of Cases Reported, the Rate per 100,000, and the Number of Deaths with the Rate per 100,000, in Montana for the years 1922–1923.

	1922				1923			
Disease	No. Cases Reported	Rate per 100,000	Reported No. Deaths	Rate per 100,000	No. Cases Reported	Rate per 100,000	No. Deaths Reported	Rate per 100,000
Tuberculosis	529	89.1	377	63.5	604	108.8	360	64.8
Typhoid fever	144	24.3	22	3.7	159	28.6	18	3.2
Smallpox	619	104.3	2	.3	732	131.9	3	.5
Diphtheria	407	68.6	64	10.8	456	82.1	52	9.4
Septic Sore Throat	23	3.9	19	3.2	20	3.6	6	1.1
Scarlet Fever	676	113.9	19	3.2	843	151.8	18	3.2
Measles	72	12.1	0	0	2535	456.6	18	3.2
Whooping cough	221	37.2	7	1.2	228	41.1	15	2.7
Chickenpox	670	112.9	0	0	1032	185.9	0	0
Mumps	426	71.8	0	0	24	4.3	0	0
Influenza	1505	253.5	182	30.7	361	65.0	120	21.6
Poliomyelitis	49	8.3	7	1.2	16	2.9	5	.9
Spotted fever	*58	9.8	*15	2.5	47	8.5	12	2.2
Trachoma	1	.2	0	0	4	.7	0	0
Tetanus	1	.2	1	.2	4	.7	4	.7
Encephalitis	19	3.2	9	1.5	32	5.8	18	3.2
Actinomycosis	2	.3	0	0	3	.5	1	.2
Erysipelas	22	3.7	10	1.7	49	8.8	27	4.9
Syphilis	279	47.0	30	5.1	124	22.3	15	2.7
Rabies	0	0	0	0	† 1	.2	† 1	.2

(*1 doubtful case.)
(†Imported case.)

TABLE VIII.

Communicable Disease Report, First 10 Months, 1924.

	Cases Reported	Deaths Reported
Tuberculosis	573	355
Typhoid fever	111	9
Smallpox	810	3
Diphtheria	402	38
Septic Sore Throat	17	0
Scarlet fever	876	25
Measles	5996	66
Whooping cough	395	25
Chickenpox	478	0
Mumps	55	0
Influenza	51	43
Meningitis	15	14
Poliomyelitis	167	21
Spotted Fever	44	10
Tetanus	1	1
Syphilis	447	*9
Encephalitis	11	8
Erysipelas	29	15
Tick Paralysis	4	0
Tularaemia	2	0

*Record of syphilis deaths first 6 months not yet available.

The oustanding facts shown in Table VII are:

(a) An increase in number of cases of tuberculosis reported in 1923 with a reduction in total number of deaths.

(b) Like circumstances in case of typhoid fever, diphtheria and scarlet fever.

(c) There were 113 more cases of smallpox reported in 1923 than in 1922 and 1 more death.

(d) Only 72 cases of measles were reported in 1922 and no deaths, while in 1923, 2535 cases and 18 deaths were reported.

(e) Whooping cough showed a slight increase in cases reported in 1923 and over double in deaths.

(f) There were only about two-fifths the number of "flu" cases reported in 1923 as in 1922 and approximately one-third the deaths.

(g) A marked reduction in poliomyelitis cases in 1923 but only a slight reduction in the number of deaths.

(h) 10 less cases of spotted fever in 1923 and 2 less deaths.

(i) The cases of encephalitis almost doubled in 1923, while the deaths did double.

(j) A reduction of over 50% in the cases reported and exactly 50% in the deaths from syphilis in 1923.

Montana had a total of 5,106 deaths during the year 1922, with a rate of 8.6 per 1,000 of population. In summarizing the 5,106 deaths we find the following particulars:

Sex	Color	Social Condition	Nationality
3154 males	4734 white	2213 single	3638 native
1952 females	295 Indian	1960 married	1325 foreign born
	39 black	760 widowed	143 unknown
	36 yellow	83 divorced	
	2 brown	90 unknown	

Diseases causing the greatest number of fatilities with their totals and rate per 100,000.

Disease	No.	Rate
Heart	585	98.6
Pneumonia (including broncho)	547	92.2
Early infancy	447	75.2
Accidental	394	66.4

Disease	No.	Rate
Tuberculosis (all forms)	391	65.5
Cancer (all forms)	338	57.0
Premature birth	266	44.8
Apoplexy	265	44.7
Nephritis	255	43.0
Influenza	182	30.7

760 deaths occurred in children under 1 year of age, making the infant mortality rate 69.6 per 1,000 living births.

Owing to the lack of clerical assistance the 1923 deaths are not yet in tabular form.

The certified copies of birth and death certificates issued by the bureau for the years 1922-1923 were as follows:

Year:	Births	Deaths
1922	239	132
1923	292	146

In addition there were numerous requests for the verification of the ages of school children, which required no certified copies. The sending of certified copies is done gratis from this office. There should be a nominal charge for all certified copies issued, also for searching the records. A goodly portion of time is consumed in searching for these records and in sending out certified copies. No other states, to the knowledge of this bureau, search their records or send certified copies of their records free of charge.

In addition to this, it might be stated that this office receives numerous requests each month for certified copies of marriage or divorce records, and it is suggested that central registration of such records should be enacted by legislation. Twenty-six states and two territories have central registration of marriage in some form, and fourteen states have central registration of divorce.

The question often arises, Why register births and deaths?, in answer to which it may be said that there is hardly a relation in life, social, legal, or economic, in which the evidence furnished by an accurate registration of births may not prove to be of the greatest value, not only to the individual but also to the public at large. It is not only an act of civilization to register birth certificates, but good business, for they are frequently used in many practical ways:

(1.) As evidence to prove the age and legitimacy of heirs;

(2.) As proof of age to determine the validity of a contract entered into by an alleged minor;

(3.) As evidence to establish age and proof of citizenship and descent in order to vote;

(4.) As evidence to establish the right of admission to the professions and to many public offices;

(5.) As evidence of legal age to marry;

(6.) As evidence to prove the claims of widows and orphans under the widows' and ophans' Pension Laws;

(7.) As evidence to determine the liability of parents for the debts of a minor child;

(8.) As evidence in the administration of estates, the settlement of insurance and pensions;

(9.) As evidence to prove the irresponsibility of minors for crime and misdemeanor, and various other matters in the criminal code;

(10.) As evidence in the enforcement of laws relating to education and child labor;

(11.) As evidence to determine the relations of guardians and wards;

(12.) As proof of citizenship in order to obtain a passport;

(13.) As evidence in the claim for exemption from or the right to jury and militia service.

DEATHS.

When a human being passes out from our life it is important that an immediate record be made of all the essential details of the event—an immediate record, because it is well-established by years of experience that an accurate record in all cases cannot or will not be made unless the law requires it to be made at once.

These records include the facts relating to the exact time and place of death, the full name, age, sex, color, civil condition, occupation, place of birth, and other details relating to the individual, and also the statement by the attending physician or coroner of the cause of death. These facts may be of the greatest legal and social importance, viz:

(1). Certificates of death, or certified copies, are constantly required in courts and elsewhere to establish necessary facts;

(2). Pension or life insurance may depend upon proper evidence of the fact and cause of death;

(3). Title and right to inheritance may be jeoparized by failure of records;

(4). Deaths should be registered that public health agencies, national, state and municipal, may know the cause of death and act promptly to prevent epidemics;

(5). Deaths should be registered promptly, that the success or failure of all measures attempted in the prevention of disease may be accurately determined;

(6). Death should be registered that the individual localities may learn their own health conditions by comparison with the health conditions of other localities and determine thereby the wise course in public health activities;

(7). Deaths should be registered that homeseekers and imigrants may be guided in the selection of safe and healthful homes.

The Bureau of Vital Statistics, in cooperation with the Child Welfare Division, instituted on January 1, 1923, the practice of sending postcard "Certificates of Registration of Birth" to the mother of each child whose birth certificate is recorded in this office. This certificate notifies the mother of a newborn child that the birth record is carefully preserved in the state registration office, specifies important items of record, gives reasons for registration, and asks if thery know of any babies in the neighborhood whose mothers have not received certificates. Many inquiries reach the office each month from mothers who have not received certificates of registration. We believe that these inquiries will in many cases lead to the registration of unrecorded births.

STATE HYGIENIC LABORATORY.

J. X. Newman, Director.

The routine work in the laboratory is steadily increasing. A survey made to ascertain the geographical scope of the service of the laboratory reveals that there are five counties, Custer, Lewis & Clark, Missoula, Silver Bow and Yellowstone, that have sent more than 1,000 specimens each. Eleven counties, Carbon, Cascade, Choteau, Dawson, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Park and Richland, sent in between 500 and 1,000 specimens. Eight counties, Big Horn, Fallon, Judith Basin, Phillips, Pondera, Teton and Wheatland, sent in between 100 and 500 specimens. Every county in the state is represented and the great distances from the laboratory did not seem to prevent the use of its facilities.

The laboratory is actively engaged in assisting physicians and health officers in finding diphtheria and typhoid "carriers". Eleven diphtheria and seven typhoid "carriers" having been definitely detected during the biennial. In two of the diphtheria epidemics the "carriers" were found to be persons with no previous history of the disease. In the typhoid cases, two had no history of previous infection; three patients had typhoid within three years; one case within two years and one case of seventeen years' standing.

The laboratory gave such special aid as was possible in the examination of spinal fluids of poliomyelitis suspects in the late epidemic.

A bacteriological examination of the throats of all the inmates of the State Orphans' Home at Twin Bridges was made. The Home had been under quarantine for scarlet fever for five months. Over 20% of the throats contained streptococcus hemolyticus. The laboratory assisted in applying the Dick test and in immunizing the inmates against scarlet fever.

In the spring of 1924 an epidemic of scarlet fever occurred in Helena. The laboratory assisted the local health officer in detecting the foci of infection.

Besides the routine work incident to infectious disease and public health, the laboratory has been very active in assisting physicians throughout the state in their diagnosis of non-communicable diseases.

2,325 such examinations were made. On account of the limited laboratory facilities within the state, patients have been sent great distances for this service. All work is of a cooperative nature. No examinations are made without the order of the physician and in no instances are any charges made.

The Division of Social Hygiene of the State of Montana cooperates with the Division of Venereal Diseases of the United States Public Health Service in carrying out the state and federal program relating to the various phases of Social Hygiene.

No appropriation was made by the state to carry on the work in this division. The amount, $519.24, was allotted by the United States Government for the fiscal year ending July 1, 1924 and $129.18 for the fiscal year ending July 1, 1925.

The responsibility of the administration of this division was placed without further state compensation into the hands of the Director of the Hygenic Laboratory.

During the year ending December 1, 1924, the following data pertaining to the activities of the Division are herein presented:

Number of cases of syphilis reported	520
Number of cases of gonorrhea reported	446
Doses of Arsphenamine administered	855
Number of Wassermann Tests	10,519
Miscroscopic examinations for gonococcus	901
Cases of venereal disease placed in detention	24
Venereal Disease pamphlets requested	27,844
Number of lectures or films shown	104
Attendance at lectures and film showings	20,806

REPORT OF STATE HYGENIC LABORATORY.

1923–1924.

	Wasserman Reaction		Widal Reaction		Diphtheria		Sputum T. B.		Smears G. C.		Urine Examinations	Tissue Sectioning	Blood Counts	Blood Sugar	Blood Culture	Vaccines	Spinal Fluid	Feces Examination	Milk Examinations	Stomach Ana'ysis	Miscell. Examinations	Containers Distributed
1923	Pos.	Total	Pos.	Total	Pos.	Total	Pos.	Total	Pos.	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
January	158	603	3	14	8	39	5	52	13	34	24	24	30	6	0	7	64	1	2	0	9	496
February	161	550	0	8	6	81	3	63	14	41	67	39	30	12	0	3	58	0	8	0	22	545
March	146	567	1	10	46	188	10	64	12	48	33	24	26	12	0	7	31	2	2	0	10	658
April	125	502	1	10	46	95	10	69	7	34	22	17	11	3	3	2	15	1	1	0	8	521
May	103	541	3	27	22	64	5	46	7	33	33	0	17	7	9	2	8	3	3	2	4	619
June	100	466	0	18	2	9	5	38	2	32	23	0	4	5	9	3	15	3	2	0	8	343
July	97	425	4	22	5	15	5	41	7	18	10	0	16	10	1	2	3	2	1	0	2	328
August	98	431	3	34	46	102	3	37	6	31	9	0	24	13	1	5	8	3	4	0	6	385
September	78	434	13	33	30	109	3	30	7	26	18	0	17	14	0	5	9	2	2	0	3	382
October	101	451	14	29	62	605	6	37	44	31	22	0	28	5	1	3	8	3	0	0	19	923
November	83	427	8	18	34	280	5	41	4	34	15	0	34	4	2	4	16	4	2	0	7	467
December	97	372	4	14	25	109	3	30	0	25	14	0	14	2	0	0	13	3	5	0	14	295
Totals	1347	5769	54	237	332	1696	63	548	84	387	290	104	251	93	26	43	248	27	32	2	112	5962

	Wassermann Reaction		Widal Reaction		Diphtheria		Sputum T. B.		Smears G. C.		Urine Examinations	Tissue Sectioning	Blood Counts	Blood Sugar	Blood Culture	Vaccines	Spinal Fluid	Feces Examination	Milk Examinations	Stomach Analysis	Miscell. Examinations	Containers Distributed
1924	Pos.	Total	Pos.	Total	Pos.	Total	Pos.	Total	Pos.	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
January	105	430	0	9	5	60	2	32	7	44	24	0	23	2	4	3	16	7	4	3	9	413
February	79	480	3	16	4	31	4	39	5	34	24	0	20	4	3	4	17	6	4	3	12	334
March	100	443	4	10	5	39	6	54	5	60	27	0	15	3	0	6	28	4	5	1	15	389
April	70	475	1	11	4	71	7	50	6	28	35	0	23	3	0	6	20	3	1	3	16	368
May	85	474	1	18	3	79	7	42	7	38	32	0	14	8	0	1	23	4	8	4	21	390
June	82	476	4	14	7	22	3	31	2	25	22	0	6	5	0	5	16	2	4	1	11	380
July	71	515	7	27	5	41	3	47	7	43	24	0	15	10	0	6	28	7	4	0	3	355
August	58	476	17	50	6	40	8	37	10	40	22	0	12	4	0	5	17	5	5	0	7	351
September	82	433	11	25	13	52	4	38	10	39	18	0	18	0	0	3	8	4	4	0	0	597
October	91	457	19	42	11	56	3	32	6	39	26	0	23	7	4	7	25	4	3	1	4	709
Totals	823	4659	67	222	63	491	47	402	65	390	254	0	169	46	11	46	198	46	42	16	96	4286

Specimens by years:

1919	3,432
1920	7,019
1921	8,856
1922	9,064
1923	9,865
1924	7,090 (10 months only)

REPORT OF THE DIVISION OF WATER AND SEWAGE.

Biennial Period Ending October 31, 1924.

W. M. Cobleigh, Consultant.
H. B. Foote, Director.

The principal work of the Division of Water and Sewage is comprised of the following activities:

1. Bacteriological and chemical examination of water samples of both public and private supplies.
2. Field inspection of public and private water supplies.
3. Inspection of plans for public water supplies.
4. Field inspection of sewage disposal systems.
5. Inspection of plans for public sewage disposal systems.
6. Inspection of tourist camps and their water supplies.
7. Inspection and approval of plans for public school buildings.

Incidental to the work with water filter plants a demand has grown for analysis of sand for filtering purposes.

Since the organization of this division and until July 1, 1923, the work was carried on at the State Agricultural College at Bozeman. On that date the office and laboratory were moved to and established in the State Board of Health building at Helena.

The assistant is available to the Division of Food and Drugs for assistance in his laboratory operations. A limited amount of interchange of work is also made with this division in the field whereby economy is effected.

Laboratory Analysis of Water.

The analysis of samples of water makes up the bulk of the laboratory work. A check upon the condition and operation of water supplies is obtained by frequent routine bacteriological analysis. In order that each supply will receive proper attention at regular intervals, a calendar has been prepared which lists for each week the supplies to which sampling equipment is to be sent. The equipment is usually sent out on Wednesday.

Grouped according to type of water supply and frequency of testing the public water supplies are as follows:

Nature of supply	Number of such plants	Frequency of sampling (routine)	Av. No. of samples each collection
Complete filtration and disinfection of surface water	8	every two weeks*	4
Filtration only	1	every two weeks*	4
Disinfection only	20	every two weeks*	3
Infiltration galleries	6	every month	4
Surface waters untreated but subject to contamination	7	every three months	3
Surface water untreated and not subject to contamination	15	every four months	3
Springs and wells	52	every six months	3

*Difficult to keep up with this schedule all through the year because of amount of equipment and assistance in the laboratory required.

The State Board of Health owns a considerable number of insulated shipping cases and bottles which are used for the collection and shipment of samples. These are sent by express, properly sealed, to the collector, who after collection of samples packs them with ice, seals and returns them to the laboratory by express, charges collect. The collector is usually the local water superintendent or the health officer, who is carefully instructed in the matter.

This system works very satisfactorily in our extensive territory where the visiting of supplies is attended by considerable expense. The local collectors for the most part cooperate in a very satisfactory way so that little delay due to their failure to collect is experienced.

For the sealing, a self-locking tin seal is used on which is stamped the name of the State Board of Health, and a number for identification.

LABORATORY WORK.

Water and Sewage Division.

Biennial Period ending October 31, 1924.

Sources of Samples	1922			1923			1924			Totals
	Nov. & Dec.						Jan. to Oct. 31			
		Chem.			Chem.			Chem.		
	Bact.	Min.	San.	Bact.	Min.	San.	Bact.	Min.	San.	
Public Water Supply	322	....	....	2057	4	12	2045	22	....	4462
Private Water Supply	30	4	2	196	13	25	278	12	1	564
Proposed Public Water Supply	2	1	....	9	4	3	18	4	1	42
School Water Supply	2	....	....	20	3	2	20	1	....	48
Railway Water Supply	....	....	....	63	....	5	96	3	....	167
Tourist Camp Water Supply	....	....	....	5	....	....	4	....	....	9
Hot Springs Water	....	....	....	4	....	....	10	12	....	26
Swimming Pool Water	....	....	....	38	....	....	10	....	....	48
Ice	....	....	....	8	....	....	2	....	....	10
Miscellaneous	....	....	....	....	....	2	....	....	3	5
Totals	356	5	4	2400	24	49	2483	57	5	5381
	363			2743			2545			5381

Field Inspections.

Practically all field work is done by railway travel since the water supplies and sewage disposal systems are in towns touched by the railroads. It is the intention and endeavor of this division to see each supply once a year and the larger, and especially the purification, plants oftener.

When in a given city private water supplies, swimming pools, ice fields and tourist camps are visited in addition to the public structures. It is our wish to do more rural work but funds are limited.

The fee system inaugurated in 1917 is in force. The fees so collected are based upon the source of the water supply and the population served.

The following tabulation shows the extent of the field work for the previous two years.

FIELD WORK.

Water and Sewage Division.

Biennial Period ending Oct. 31, 1924.

Type of Plant Investigated	1922 Nov. & Dec.	1923	1924 Jan. to Oct. 31	Totals
Public Water Supply	8	127	131	266
Private Water Supply	1	14	24	39
Proposed Public Water Supply	....	1	3	4
Railway Water Supply	....	13	17	30
School Water Supply	....	3	3	6
Tourist Camps and Water Supply	....	2	4	6
Hot Springs	....	1	8	9
Swimming Pools	....	1	3	4
Ice Supplies	....	5	2	7
Sewage Works	....	36	30	66
Totals	9	203	225	437

Filtration Plants.

There are now nine rapid sand filter plants in Montana Eight of these are municipally owned, while one is at the Fort Belknap Indian Agency. They are constructed and operated along modern designs and methods and quite uniformly produce results which are both pleasing and satisfactory. Water of the Milk, Missouri and Yellowstone rivers are thus purified so that the communities receive water of as good physical and sanitary quality as is possible to obtain at these respective places. The chemical qualities of the various waters are not materially changed nor is it possible in every instance to eliminate all the odors and tastes peculiar to these river waters. In general the plants are under the care and supervision of high grade men who take their duties seriously and perform them with credit.

In most of the plants some sort of a laboratory is maintained in which tests are made that assist the operators in their work. The enlargement and extension of this work is urged by the State Board of Health as a means for the further improvement of the plant output.

A plan is being tried of furnishing such laboratories with materials at cost from the Helena laboratory. This will tend to standardize the analysis and make results more truly comparable.

The Milk and Lower Yellowstone rivers are particularly difficult streams to handle during the spring season due to flood waters and excessive turbidities. Trouble was experienced in the summer and early fall of 1923 and 1924 at Great Falls due to abundant growths of algae which infected the river as far up as Helena. Fortunately these did not produce odors and tastes but they were particularly aggravating in clogging the filter beds. The algae were Nostoc and Anabaena.

The turbidity of the Milk river at Chinook and Harlem is of a fine chalky nature and slow to settle. An unusually long sedimentation period is desirable if the filter beds are not to be overburdened. The physical qualities of this water are improved by the introduction of water from the St. Mary's project in Glacier Park. Larger settling basins at these two places would, without doubt, improve the operation and results.

It is planned to give more attention in the next few months to the quality of the sand used.

The following tabulation giving these figures for 1923 is intended to show something of the work of these plants.

RAPID SAND FILTER PLANTS (MONTANA)

Figures for 1923

City	Constructed	Total Gallons Filtered	Total Gallons Used for Washing	Lbs. of Alum	Lbs. of Lime	Lbs. of Chlorine	Population Served	Superintendence Operation	Superintendent
Billings Yellowstone R.	1915	806,845,000	13,051,400 (6 filters)	143,502	....	870.5	17,000	Superintendent and 3 operators	J. F. Willett
Chinook Milk R.	1916	44,191,000	800,000 (2 filters)	8,000	5,000	300.0	1,200	Supt. with 1 Ass't. (also operating light plant	F. E. Brandis
Glendive Yellowstone R.	1917	339,500,000	17,760,000 (4 filters)	100,128	....	743.5	4,000	Supt. who is also City Eng. and 2 operators	R. T. Hurdle
Great Falls Missouri R.	1916	1,518,480,000	33,776,000 (8 filters)	352,225	139,850	1975.0	25,000	Supt. (Cy. Eng.) 3 operators (no pumping by these men)	M. L. Morris
Hardin Big Horn R	1920	36,633,400	(2 filters)	20,240	8,360 (soda ash)	30.5	1,200	Supt. and 1 operator	R. B. Reed
Harlem Milk R.	re-modeled 1922	14,600,000	130,000 (1 filter)	1,800	....	100.0	600	Superintendent	W. H. Granger
Livingston Yellowstone R.	1918	603,410,000	16,084,000 (4 filters)	20,000	....	364.	7,000	Supt. and 3 operators	J. R. Corteso
Miles City Yellowstone R.	1910–11	251,373,000	35,975,000 (6 filters)	235,097	....	376	8,000	Supt. and 3 operators	C. E. Becraft
Totals		3,615,032,400	117,576,400	880,992	153,210	4759.5	64,000		

Does not include Fort Belknap Indian Reservation at Harlem nor the slow sand filter at Columbus.

Liquid Chlorine Disinfection.

The use of this material for disinfection of water has come into common use because of its relative economy and high efficiency, especially in waters of low turbidity. One authority states that seventy-five per cent of the people in North America drink water that has been chlorinated. It is obviously true that water which needs no purification is preferable to that which is contaminated and requires it, but it is also obviously better to use chlorine than to risk the appearance of typhoid fever and such other diseases as might occur otherwise.

An average dose in Montana into a water not heavily contaminated is two pounds per million gallons. In some, one pound is sufficient. Such an amount does not ordinarily produce any foreign tastes or odors, nor is it an amount which will in any way affect the human system.

There are twenty-eight of these installations in the state including those in filtration plants. Hypochlorite of lime or chlorinated lime is used in two communities. The same effect is obtained as with liquid chlorine though it is more difficult to obtain a uniformly adequate and satisfactory dosage. Listed, these plants are as follows:

Number of chlorine machines in filtration plants	9
Number of chlorine machines other than in filter plants	19
Number of hypochlorite of lime plants	2
Approximate population supplied with such treated water	154,000

There is now available to any operator a delicate and simple test for the determination of the proper dosage of chlorine. This is the ortho-tolidin test for excess of chlorine. The method of use appears below. The ortho-tolidin may be obtained upon application to the State Board of Health. The test is used by most operators.

Ortho-tolidin Test.

To a glass tumbler* half full of water to be tested, add twenty drops of ortho-tolidin and allow to stand at least five minutes. Small amounts of free chlorine will give a yellow color and larger amounts an orange color. Fifteen minutes should have elapsed between the application of the chlorine to the water and the making of the test.

To detect a slight color, it would be well to have a second glass or tumbler containing an equal amount of water to which no ortho-tolidin has been added. By comparison of the two the slightest change in color may be detected.

*Or use two clear glass tubes of 150 c.c. capacity taking 100 c.c. in each. Standard colors for comparison may be used.

Cisterns.

In some sections of the state, as for instance, the Huntley District, where ground water of good quality is obtained with difficulty, water is taken from a stream and placed in cisterns for storage. It is believed that this water has been the cause of typhoid fever in these sections. An attempt is being made to enlist the support of as many residents as possible in a movement to disinfect this type of water supply. Hypochlorite of lime lends itself well to this purpose. The method used has been devised by experimentation. A description of it may be obtained upon application to the State Board of Health, Helena.

Algae.

Troubles with algae are relatively rare in this state due to the absence of many large impounding reservoirs located where the conditions are proper for growth. Where such reservoirs are in existence, however, some trouble is experienced. In Butte, Anaconda, Helena, Havre and Harlowton, algacides in large reservoirs or covers for small distributing reservoirs have generally solved the difficulty.

Copper sulphate (blue stone) is employed for killing the organisms. If difficulty is experienced the type of algae should be determined in order that a proper dose or remedy may be applied. The water laboratory is always ready to assist in this work.

Algae are plants of a low order and form. Ground waters from springs or wells may contain a relatively high content of Co2 or carbonic acid. This constitutes a food for algae so that when such waters are stored in open sunlit reservoirs growths may become abundant.

The disagreeable effects of the abundant growth of algae are production of bad odors and tastes, directly and by the disintegration of plant bodies; coloring of the water; increase of food material for bacteria and low animal forms with their consequent multiplication; clogging of pipes and fittings. More attention should be given to this important subject by local water superintendents.

Tourist Camps.

An attempt is made to keep a close check on all tourist camps as to the general sanitary conditions and drinking water. A set of regulations designed to take care of this problem was recently promulgated by the State Board of Health.

Splendid camps have been established in many cities. Other are being established every year. We want to present to all auto tourists in our state facilities for camping which are a credit to our progressive ideals.

Especially do our forests appeal to the eastern tourists. The Forestry Service has done much excellent work in fostering the proper use and enjoyment of these areas. In order to promote this highly desirable feature the State Board of Health has deputized all Forest Supervisors in the state as deputy health officers, giving them the additional authority from the state, vested in such officers. Splendid co-operation has been experienced between these men and this division in the matter of sanitation within the forests.

Swimming Pools.

The question of the sanitation of swimming pools has claimed our attention for a number of years. There are several Y. M. C. A. pools in the state and one municipal pool has been in operation for a number of years. Within the past four years, however, there have been a number of municipal pools built. Among there are Glendive, Harlowton, Havre, Deer Lodge and Billings. One is contemplated for Miles City and one for Anaconda.

For the most part the Y. M. C. A. pools are well built and equipped so that control of the physical and sanitary quality of the water is more easily obtained. The outdoor pools present a more difficult problem, however, since no refiltration systems are installed and the sun is used to warm the water, a fact which operates to reduce the amount of new water used. There is a tendency to keep a water once warmed for a long period of use. In nearly all cases also there is little, if any, money provided for maintenance, hence the pools are operated as economically as possible.

More investigational work is necessary in order to determine the best manner of operating and controlling such pools as these. This is contemplated for the immediate future.

Hot Springs.

There exists in Montana several natural hot springs. In most cases these have been developed by individuals as commercial propositions. Some are advertised as bath and drinking water beneficial to the health. Others are used essentially as pleasure resorts. All are used to a certain extent as the latter.

Preliminary investigations both from sanitary and chemical standpoints have revealed the necessity of more thorough study, with a view to conserving and promoting the health of the people. Such a study is included as a part of the program of this division.

Certification of Water Supplies Furnished by Common Carriers.

This work is carried on as heretofore in co-operation with the United States Public Health Service. For the year ending June 30, 1924, the Public Health Service reported a total of 31 such supplies in Montana with 29 or 94% satisfactory and certified and none as unsatisfactory. One of the two not certified was under construction. The other was a supply listed as used but upon investigation it was found not to be so used. These two points are now satisfactorily adjusted so that 100% certification is anticipated for the next year.

Public School Buildings and Water Supplies.

The approval of the State Board of Health is required for all new school buildings as regards lighting, heating and ventilation. Surveys of schools, especially those of rural districts, show a need of more attention to water supply. The work in this line is going steadily forward in co-operation between the local school and health boards and the State Board of Health.

Inspection of Building Plans.

The past two years has seen a dearth in building, especially of municipal water and sewage systems. The following tabulation shows the number of building plans examined:

Water Supply	6
Sewage Disposal	1
School Buildings	36
TOTAL	43

Respectfully submitted,

H. B. FOOTE.

INVESTIGATION OF STREAM POLLUTION BY MILL TAILINGS.

W. M. Cobleigh, Bozeman.

There are a number of streams in the state that receive tailings from concentrators handling various grades and types of ore. In some instances there is a possibility of these tailings affecting the physical characteristics of domestic water supplies. In other instances the presence of tailings in surface waters has some effect upon fish life. For these reasons it was decided to determine the possibility of removing the solids from tailings by sedimentation before delivery to a surface stream. Preliminary experiments were first conducted in the laboratory. Tailings were submitted to plain sedimentation and to coagulation processes with alum and lime and with "alkalinized" alum solutions. Preliminary experiments indicated that plain sedimentation alone would not be entirely satisfactory and that the cost of alum solutions would be prohibitive. It was then found that results could be obtained by plain sedimentation followed by treatment with sulphuric acid to establish the optimum hydrogenion concentration for further sedimentation.

After the preliminary laboratory tests were completed it was decided to conduct experiments on a larger scale at some mill which would afford the proper conditions and facilities for such work. Through the kindness of Mr. H. C. Bacorn, manager of the Jardine Mining Company, opportunities were afforded for treating a fraction of the tailings of the Jardine mill by preliminary sedimentation in tanks, followed by acid treatment and further sedimentation in baffled tanks. Considerable data were obtained in experiments extending over a number of days. These data are now being assembled in order that conclusions may be drawn regarding the efficiency of sedimentation followed by acid treatment and further sedimentation.

It should be understood, however, that the location of many concentrators in the state is such that it makes it very difficult to find sufficient ground on which to deposit the solids after they have been removed by sedimentation from the mill tailings. This is true in cases where the concentrator is located in a narrow valley. In some instances there is not enough ground along the banks of the stream draining the valley on which to deposit the tailings by sedimentation. In other cases it would be difficult to store the tailings and protect them from subsequent errosion during heavy storms or spring freshets and thus prevent them from ultimately reaching the main drainage channel of the valley. This, in fact, is in some instances the controling factor which should be fully appreciated before demands are made on the mining companies to prevent entirely the pollution of surface streams.

A preliminary study was made of the effect of the Jardine mill tailings in the Yellowstone River. The tailings are delivered to Bear Creek approximately one mile below the mill. Bear Creek empties into the Yellowstone River two or three miles above the town of Gardiner. Turbidity measurements were made at the mouth of Bear Creek and at several points above and below the mouth of Bear Creek and the following data were secured.

Stream	Location	Turbidity parts per million
*Bear Creek	At mouth	500
Yellowstone River	Above mouth of Bear Creek	Less than 5
*Yellowstone River	About 50 Yds. below mouth of Bear Creek on Bear Creek side (10–15 ft. out from shore)	400
Yellowstone River	At base of Red Reef about ¼ mile below mouth of Bear Creek	40
Yellowstone River	Opposite flate table rock about ⅜ to ½ mile below mouth of Bear Creek	24
Yellowstone River	Just below island about ¾ mile below mouth of Bear Creek	6

*These samples were allowed to settle for one minute to separate the sand which is not classed as turbidity. A thin layer was obtained in both cases.

The above data shows at the time this investigation was conducted that the tailings from the Jardine mill could not be detected in the Yellowstone River by turbidity measurements distances beyond ¾ of a mile below the mouth of Bear Creek. The tailings can be detected by the eye in the Yellowstone River water just below the mouth of Bear Creek but sedimentation and the mixing of the tailings with the river water soon produce results which make it impossible to detect the tailings by turbidity measurements or by the eye.

The data obtained in this one investigation of the effect of the tailings on the Yellowstone River should be verified at different seasons of the year before any definite conclusions are drawn in regard to the general effect of the tailings on the Yellowstone River.

REPORT OF THE FOOD AND DRUG DIVISION.

W. M. Cobleigh, Consultant, Bozeman.
G .D. Wiles, Director, Helena.

The Food and Drug Division is charged with the enforcement of the provisions of the Montana Pure Food and Drugs Act of 1911, and in addition to this, State Board of Health licenses are issued through this division to all—

1. Public eating places,
2. Meat markets,
3. Manufacturing bakeries,
4. Manufacturing confectioneries,
5. Soda fountains, ice cream parlors and soft drink establishments,
6. Canneries,
7. Bottling works.

A separate license is required for each class as listed above. This license must be taken out from the State Board of Health the first of each year. The fee for a license is two dollars and licenses are not transferable from one party to another.

The State Board of Health has rules and regulations governing the sanitary operation of food establishments, and these rules and regulations are enforced by local and county health officers and other representatives by the State Board of Health. In addition to the places licensed, that are subject to inspection, there are the grocery stores, and hotels that operate rooms only. A monthly inspection is required by local and county health officers of all licensed food establishments and also of grocery stores. An annual inspection is required of all hotels under the provisions of the Montana Hotel Law.

Fees collected for licenses issued are turned in to the State Treasurer and placed to the credit of the general fund as provided for by law. The following sums have been turned in to the State Treasurer since the law became operative, January 1, 1922:

For the year 1922	$ 5,948.00
For the year 1923	6,128.00
For the year 1924 (to November 1st)	5,790.00
Total sum remitted to the State Treasurer in two years and ten months	$18,376.00

Inspections.

Local and county health officers are credited with the number of inspections corresponding to the number of score cards received at this office each year. No doubt many inspections are made by local officers and no score cards are filled out and mailed in, hence the inspections actually made will greatly exceed the number of which we have record.

During the past biennial period we have received a total of 17,527 sanitary inspection reports from local and county health officers. During this same period of time a total of 2,527 sanitary inspections were made by inspectors from the State Board of Health Food and drug division. Inspectors for the Water and Sewage Division have assisted in making this number of inspections. It is the aim of the State Board of Health to assist local health officers as far as funds will permit, by making inspections once a year throughout the entire state, and as many special investigations as are made necessary by complaints received. Economy in printing prevents giving a detailed report of each local and county health officer or of each town or city inspected by representatives of the food and drug division. The State Board of Health is perfectly aware of the fact that everything is not as it should be in many food establishments operating in the state, but it is contended that a maximum amount of work is being done on food sanitation for the amount of money which is provided.

Licenses Canceled and Prosecutions.

Under the provisions of Section 2589, Revised Codes of Montana, 1921, the Secretary of the State Board of Health is given the authority to cancel a State Board of Health license when it is found on inspection by an authorized representative that a food establishment is not being conducted within a reasonable degree of compliance with regulations of the State Board of Health. Acting under this authority the Secretary canceled the following licenses during the past two years:

Roberts & Warner	Shelby	Insanitary Cafe
Dahl & Carlson	Shelby	Insanitary Restaurant
M. H. White	Bozeman	Insanitary soft drink parlor
Saylor & Smelts	Livingston	Insanitary Cafe
Gust Spannos	Livingston	Insanitary confectionery
Dan Mundy	Billings	Insanitary soft drink parlor
Everett Knaus	Sweet Grass	Insanitary Cafe
J. C. Stearns	Shelby	Insanitary Restaurant
Hamilton Cafe	Hamilton	Insanitary Cafe
Mrs. Cora Nielson	Hamilton	Insanitary Cafe
H. E. Howard	Roundup	Insanitary Cafe
F. M. Holman	Sidney	Insanitary Cafe
F. M. Holman	Sidney	Insanitary soda fountain
Mrs. Josie Kline	Livingston	Insanitary Cafe
R. S. Mitchell	Roy	Insanitary Cafe
Charles Hanbow	Columbia Falls	Insanitary Cafe
J. M. Parsons	Kalispell	Insanitary meat market

Proceedings were instituted against the following parties for various violations of the Food and Drug Act, as noted:

Leo Bowers	Melstone	Sale of adulterated hamburger; no action taken by county attorney
Lasby Drug Co.	Townsend	Complaint filed for failure to take out soda fountain license.
Ell Robinson	Columbia Falls	Sale of adulterated hamburger; fined $25.
T. S. Morris	Columbia Falls	Sale of adulterated hamburger; fined $25.
Weggenman's Market	Helena	Sale of adulterated hamburger; fined $25.
H. C. W. Richter	Helena	Sale of adulterated hamburger; fined $25.
C. A. Tomberg	Denton	Sale of adulterated hamburger; fined $25.
Andrew Vilebir	Belt	Sale of adulterated hamburger; case pending.
Haupt & Stevens	Lewistown	Failure to take out cafe license after three notices.

Fines imposed for convictions obtained go into the general fund of the state treasury.

Food and Drug Laboratory Report.

During the first part of the past biennial period (November 1, 1922, to June 30, 1923) food and drug samples were examined at the State College of Agriculture and Mechanic Arts, Bozeman, under the direction of Professor W. M. Cobleigh. On July 1, 1923, the food and water laboratory equipment belonging to the State Board of Health was moved to Helena and the laboratories were installed in the State Board of Health building.

Owing to the limited funds available for chemical work, only the minimum necessary chemical work has been done in the food laboratory. As a result of this curtailment, the number of food samples examined the past biennial period is below the number analyzed during the preceding biennial period. An arrangement has been made with the dairy division of the State Department of Agriculture whereby the food and drug laboratory examines the butter samples for the dairy division. Inspectors for the dairy division make field tests, and through a process of elimination the number of samples of which the food and drug laboratory is obliged to make a complete analysis, is reduced to a minimum.

The director of the food and drug division acts as a supervisor of the sanitary inspection work done by local and county health officers, acts as an inspector, purchases food and drug samples for analysis, acts as analyst in the food and drug laboratory and looks after the licensing of food establishments as provided for in section 2589, Revised Codes of Montana, 1921.

It is to be hoped that the legislature will see the wisdom of providing a sum of money sufficient to enable the food laboratory to carry out chemical work in keeping with the demands made upon it by municipalities throughout the state, and also in the proper enforcement of food and public health laws. An appropriation equal to the amount of fees collected through the issuance of licenses by the food and drug division, would enable it to function properly for the benefit of the more than a half million people that it serves.

During the past biennial period a total of 318 samples of foods and drugs were analyzed. These samples consisted of the following articles: butter, candy, cider, coffee, cookies, cream, chewing gum, flour, hamburger, hydrogen peroxide, honey, horseradish, iodine tincture, meat, olives, preserves, preservatives, salmon, salt, salt petre, sausage, soft drinks, sugar, tomatoes, vinegar, wine, and miscellaneous food and drug samples. Of the samples analyzed 15 samples were not classified. Three hundred and three were classified as "passed" or "not passed". The number not passed was 125, or 39 per cent. The number passed was 178 or 56 per cent.

BIENNIAL REPORT OF THE CHILD WELFARE DIVISION, STATE BOARD OF HEALTH FOR 1923-1924.

Frances Sage Bradley, M. D., Acting Director.

In 1919, Montana had the unenviable position of reporting the highest maternal mortality of any state in the country, and the highest infant death rate of any of our great northwestern states.

It seemed opportune therefore that the legislature of 1923 should make an annual appropriation of $8701.91 for the protection of maternity and infancy. This sum was matched by federal funds (Sheppard-Towner appropriation) and $5000.00 per year added. Thus for an investment of $8701.91 Montana receives annually the sum of $22,403.82.

According to the provisions of the Act, the administration of this fund was placed in the Division of Child Welfare of the State Board of Health and its activities have been as follows:

1. Office Work.

As the work of the Division of Child Welfare is largely educational in character, many of its activities are directed from headquarters. They are pursued in close cooperation with other divisions of the State Board of Health and with various agencies interested in the welfare of children.

I. Cooperation with the divisions of the State Board of Health.

(a) Vital Statistics.

In conjunction with the Division of Vital Statistics the Division of Child Welfare maintains one clerk who serves also as bookkeeper for this Division. Especial effort has been made to check up on the incomplete birth registration which nearly cost us our standing in the Federal Birth Registration Area (which requires the reporting of at least 90% of all births). In cooperation with the Division of Vital Statistics, enough unrecorded births have been secured to maintain our eligibility in above area, and it is believed that the joint publicity of these two Divisions will lead to more complete registration hereafter. Attractive cards are sent to mothers upon receipt by the State Board of Health of birth certificates of all children.

(b) Venereal Disease.

The Division of Child Welfare employs a part time laboratory technician to make urinalyses, sputum, blood and smear tests for women and children. The demand for this work is steadily increasing. Ampules of Silver Nitrate are distributed to doctors, nurses, hospitals and maternity homes for the prevention and cure of opthalmia neonatorum.

(c) Epidemiology.

The Division of Child Welfare feels sorely the need of a Division of Epidemiology in the State Health Department. This fact was acutely demonstrated by a recent outbreak of poliomyelitis (infantile paralysis) and by the annual incidence of diptheria, scarlet fever and less grave diseases common to young children.

II. Cooperation with other agencies.

The practical cooperation of outside agencies has been secured, as the Medical and Dental Societies, State Nurses' Association, State Department of Education, Bureau of Child and Animal Protection, Montana Tuberculosis Association, American Red Cross, County Commissioners, Women's Organizations and the like. These have contributed of their time and money by holding children's health conferences for weighing, measuring and examining so-called well children, and by conducting clinics for the correction of medical, surgical and dental defects. They have given practical aid in support of public health nurses in securing school lunches in rural schools or extra milk for poorly nourished children, in the placement of children needing special care and in many other ways.

III. Educational Work.

(a) Traveling Libraries.

This Division loans libraries to schools, women's clubs and other interested agencies.

(b) Literature.

The Division of Child Welfare has prepared a Mother's Manual, a course of instructions for midwives and diet cards for young children. It also keeps on hand a supply of booklets, bulletins and leaflets of the U. S. Children's Bureau, American Child Health Association and other recognized agencies. These are issued by mail or through proper personal channels to present and prospective mothers.

(c) Exhibit Material.

The Division has a collection of excellent moving picture films on health subjects which may be loaned to responsible persons. There are also a series of home made health posters and other exhibit material which are constantly in the field.

(d) Code of Montana Laws.

This Division employed the services of an expert to codify the laws of Montana relating to children. This compilation is now at the disposal of the public, and contains illuminating information as to what Montana is and is not doing to conserve the interests of her children.

2. Field Work.

It is believed that the hazards of maternity and infancy in Montana are due largely to the great distances from relief in time of need, and to the consequent custom of depending upon untrained help during the periods of pregnancy, confinement and early infancy. As personal demonstration is the most effectual means of teaching the need and the detail of adequate care, the Division of Child Welfare has concentrated upon its field work.

In cooperation with the Montana Tuberculosis Association, the Division of Child Welfare has placed an expert public health nurse in each of four districts of the state. These women supervise the work of all nurses in their districts, and stimulate an interest in the employment of at least one nurse to a county. In conjunction with the county superintendent of schools and women's organizations, they meet with groups of citizens and prominent individuals, hold children's health conferences in schools, churches and other public buildings, inspect children and advise mothers and prospective mothers concerning the importance of securing medical supervision.

In addition to the four district nurses, the Division of Child Welfare has cooperated with the Montana Tuberculosis Association, the American Red Cross, County Commissioners and Women's Clubs in supporting a nursing service in counties where such aid seemed advisable. These women, like the four district nurses, are required to give such portions of their time as are maintained by Sheppard-Towner funds, to the protection of maternity and infancy. The remainder of their time is devoted to a more general service. Through cooperation with the Home Economics Division of the State College, demonstrations have been arranged for showing the care and preparation of suitable foods for growing children. Courses on child care have also been given in mothers' camps.

Local doctors and dentists have given of their services when necessary in the examination of children, and hospitals have generously housed and cared for them during the correction of defects.

A careful check is being made on all maternity homes in order to accurately place the responsibility for the high maternal mortality and the low birth rate which is accredited to this state.

Midwives also are being investigated for the same purpose.

A provisional list is being prepared of all crippled, and all feebleminded children in the state needing special care.